Annex H

Report of the Sub-Committee on Small Cetaceans

1. PARTICIPANTS, AGENDA AND INTRODUCTORY REMARKS

Members (M) of the Scientific Committee, invited experts (E), observers (O), and interpreters (I) attending the meeting were:
Aguilar (M), Balcomb (E), Best (E), Braham (M), Broadhead (M), Brown (M), Brownell (M), Cawthorn (E), Collet (E), Christensen (M), Davis (E), Gaskin (E), Glover (O), Gong (M), P. Hammond (O), T. Hammond (E), Holt (M), Ivashin (M), Jones (E), Kapel (M), Kato (M), Kasuya (M), Klinowska (M), Leatherwood (E), Makeyev (I), McNamara (M), Mitchell (E), Nielsen (O), Ohsumi (M), Perdomo (M), Perrin (M), Quiroga (M), Sanpera (M), Shima (M).

Some participants did not attend all sessions of the meeting.

Perrin chaired the meeting and edited the report. Braham, Brownell, Collet, Gaskin, P. Hammond, Klinowska and Leatherwood served as rapporteurs.

The draft agenda was adopted after addition of an item 'Review of new information on other exploited small cetaceans' (Appendix 1).

2. REVIEW OF DOCUMENTS

Small cetacean documents (SC/35/SM1-34) submitted to the Scientific Committee are listed in Annex C of the main report. Also containing information on small cetaceans were SC/35/ProgReps Australia, Denmark, France, Iceland, Japan, New Zealand, Norway, UK, USA and USSR; IWC/35/11 and 19; SC/35/O 4; SC/35/PS1, 2, 3, 5, 6, 12, 15, 20 and 35; SC/35/Ba7; issues LXXXIX and XC (bound together) of the International Whaling Statistics and provisional statistics for catches outside the Antarctic in 1982.

3. REVIEW OF EXPLOITED POPULATIONS OF PHOCOENIDS

3.1 Harbour porpoise, *Phocoena phocoena*

The paper by Gaskin (SC/35/SM24) was used as the framework for the review of this species.

3.1.1 Population identity

The group agreed that the major divisions suggested by Gaskin (Bering Sea – North Pacific, North Atlantic and adjacent seas, and Black Sea – Sea of Azov) are undoubtedly separate. They also agreed that these 'regional populations' are likely composed of semi-isolated sub-populations such as those defined in SC/35/SM24 (Fig. 1), but that present knowledge in most cases is not adequate to allow delineation of boundaries between them. Sightings data do exist for some of the gaps indicated between the sub-populations, in the documents of this meeting (SC/35/SM5, 18) and in various unpublished data files; this information as available will be included in the final version of SC/35/SM24. It was also pointed out that hunting and sighting effort has been extremely low in some of the supposed gaps.

Also questioned was the inclusion in the ranges in SC/35/SM24 of deep-water areas, such as central Davis Strait and portions of the western Bering Sea. It was agreed that the harbour porpoise probably does not inhabit such areas, and the distribution map will be amended accordingly. Some other, minor range changes were suggested by members of the group and will be included in the revised map.

Gaskin reported that highly significant meristic and morphometric differences have been found between samples from the eastern and western North Atlantic, suggesting that these populations may be genetically isolated to a high degree (Yurick, 1977).

The group agreed that considerably more research will be necessary before most sub-populations can be adequately defined (see Recommendations) but that the sub-population units given in SC/35/SM24 provide a good provisional basis for review and planning.

Kapel informed the sub-committee that information on the occurrence of all small cetaceans, including harbour porpoises, is being collected at the Faroe Islands (Dorete Bloch, Museum of Natural History, Torshavn).

3.1.2 Population size

The sub-committee reviewed the tabulated estimates of population size in SC/35/SM24, area by area; in most cases no information was available. Some new documents and unpublished information were useful in providing updated provisional size estimates for other areas, e.g. Gulf of Alaska and Puget Sound, but no major changes were made.

The estimate for Washington to Southern California (600) was questioned because it is based on an aerial strip census. Gaskin reported that his research shows that the animals usually occur in small groups (commonly <5) and that they spend only about 7% of the time at the surface, diving and surfacing synchronously. This behaviour makes it likely that a significant proportion of animals may be missed in an aerial census, even directly on the track line. Also, as pointed out in SC/35/SM1, this species can be fairly easily confused with the Dall's porpoise under some circumstances. Both of these problems should be taken into consideration in designing a census survey.

3.1.3 Catches

Members of the group provided several corrections and additions to the catch data in SC/35/SM24 (for the Bering Sea, Gulf of Alaska, British Columbia, France, Greenland and Japan). Kasuya reported that harbour porpoises

reported in SC/35/ProgRep Japan (and earlier progress reports) taken by harpoon in northern Japan were likely not harbour porpoises. More effort to identify animals taken is needed in that region.

It was noted that the 1,000–2,500 porpoise under 'incidental catches' for West Greenland in SC/35/SM24 have already been subsumed in the estimated directed take in the Danish statistics (the figure for directed take should be 500–1,500). Revised statistics for Greenland (1971–81) are provided in SC/35/SM19.

The takes by American Indians in the Gulf of Alaska are probably historical only; Braham reported that no catches have been observed or reported in recent years.

New data on incidental takes are included in SC/35/SM5 (northeastern Pacific and adjacent Arctic waters) and SC/35/SM14 (Danish fisheries, previously undocumented).

The sub-committee noted that substantial numbers of harbour porpoises (and porpoises of other species) die in gillnets in several types of fin-fish fisheries around the world (previous reports of this sub-committee). It is uncertain whether this indicates a special vulnerability or simply a conjunction of porpoise density and gillnets, but, in any case, research is urgently needed to investigate this special problem (see Recommendations).

3.1.4 Status

Very little information is available on the status of stocks of the harbour porpoise, but there is reason for grave concern in at least two areas.

(1) As reported in SC/35/SM14 and reviewed in SC/35/SM24, it is possible that a significant population decline has occurred in the Baltic – North Sea region. This may be due to pollution, disease, or by-catches. A decline may also have occurred along the coast of France (Duguy, Hussenot and Prieur, 1982). Andersen and Clausen (SC/35/SM14) reported a downward shift in overall size distribution and in distribution of size in sexually mature females between samples collected in a directed fishery in the early 1940s and samples from the by-catch in recent years. The group concluded that a shift in length at maturity seems unlikely, because a density-dependent response is usually manifested in a faster growth rate rather than in a smaller size at maturity. Gaskin reported that studies to compare ages in the two samples are underway. It was also noted that the different methods of capture (directed vs by-catch) may have resulted in differential age or size bias in the two samples. It is clear, in any case, that the population(s) may be in serious trouble and that assessment research should be continued and augmented.

The sub-committee notes that the coast of Norway could be of great importance as the eastern North Sea habitat of this species and suggests that scientists undertaking killer whale censuses in Norwegian waters be asked to extend their investigational scope to include *P. phocoena*.

(2) The other region of possibly serious depletion is the Black Sea. Knowledge of the fisheries and small-cetacean populations in the Black Sea were reviewed by this sub-committee last year (*Rep. int. Whal. Commn* 33: 152). In recent years, the bulk of the take by Turkey of several thousand animals annually for reduction to meal has been composed of harbour porpoises. The Turkish Government this year instituted a ban on any further take (see Item 6 below).

The situation in West Greenland is less clear. Some members of the group agreed with the tentative conclusion of SC/35/SM19 that the long series of stable by-catches since the 1930s (except for an increase in the late 1960s–early 1970s when a foreign salmon fishery operated off Greenland) indicates that the population has not declined. Other members, however, did not agree with this view. All agreed that the information necessary for an assessment of status (abundance, fishing effort, catch composition, vital rates) does not exist and that research would be necessary to obtain the information.

3.1.5 Recommendations

(1) Research is needed to define the populations. Member governments should be advised to sponsor comparative studies of morphology, parasite faunas, biochemistry/cytology, and reproductive parameters and seasonality. Collection of osteological specimens (with life-history information) from localities poorly represented in collections, such as Iceland, should be encouraged.

(2) As for other small cetaceans, more accurate and complete reporting of incidental take is needed. Member governments should be advised to upgrade their reporting system. For *Phocoena*, this is especially important for nations bordering the Baltic and North Seas and for the far-eastern nations.

(3) Member nations taking harbour porpoises incidentally in gillnets, e.g. Denmark (SC/35/SM14), should be advised of the preliminary results of experiments with anti-entanglement acoustical warning devices presently being tested for Dall's porpoise, *Phocoenoides dalli*, in the salmon gillnet fishery of the North Pacific (SC/35/SM28). This advice could also be offered to non-member nations with such a take, e.g. Canada (SC/35/SM5).

(4) Denmark should be advised to undertake research to collect data that will eventually allow assessment of the population(s) of harbour porpoises affected by fisheries in West Greenland.

3.2 Cochito, *Phocoena sinus*

The published account by Brownell (1983) was circulated. Brownell indicated that 26 specimens are now known. The status of the species is unknown, but since the fishery for *totoaba* (Sciaenidae) ceased, *Phocoena sinus* is no longer at risk from the extensive gillnetting for that species. The sub-committee noted that a series of recommendations for research had been made at the FAO meeting in Bergen 1976 but that little action has resulted other than two short-term surveys which made four sightings, none of which were confirmed (Villa-R, 1976; Wells *et al.*, 1981). The group agreed that a good abundance estimate is the primary requirement. At the very least, a survey of fisheries should be carried out to see if the animal is still being taken incidentally. This also could yield specimens from which data on life-history parameters could be obtained. Leatherwood reported that, as a result of diversion of flow in the Colorado river, the US Bureau of Reclamation will carry out extensive surveys in the delta region. The survey team could be alerted to watch for stranded specimens. Perdomo indicated that he will discuss the possibility of work on this species with staff of the National University (Mexico City). It was also noted that a workshop on the species will be held in conjunction with the 9th annual meeting on the marine mammals of Baja California to be held in March 1984 in La Paz, B.C., Mexico.

3.3 Spectacled porpoise, *Phocoena dioptrica*, and Burmeister's porpoise, *P. spinipinnis*

The sub-committee had no new information on the latter, but were informed by Cawthorn that an article in press by E. Fordyce contains a range extension for *P. dioptrica* to MacQuarie Island, Australia. Nothing is known of population identity, size or status for these species. *P. spinipinnis* is taken in nets on the west coast of South America, but catch statistics are not available (Brownell and Praderi, 1982).

3.4 Dall's porpoise, *Phocoenoides dalli*

3.4.1 Population identity

The most recent work on this question is that of Kasuya (1978 and 1982) for the western North Pacific. He identified three populations: a 'Sea of Japan – Okhotsk Sea population', an 'offshore western North Pacific and Bering Sea population' (involved in the high-seas salmon gillnet fishery—SC/35/SM8), and a 'Japanese east coast population' (the object of a land-based harpoon fishery in Japan). These divisions are based mainly on the relative frequencies of two colour morphs called 'dalli-type' and 'truei-type'.

Braham presented unpublished distribution data for the entire North Pacific obtained from vessels of opportunity (supplementary to the data in SC/35/SM18). There are no obvious gaps in distribution that might indicate existence of sub-populations within the overall offshore North Pacific and Bering Sea range. There are sightings for all areas of sighting effort. While uneven effort coverage (SC/35/SM12) complicates the picture, the species appears to be less abundant in the Bering Sea.

Studies to examine stock identity are underway at the US National Marine Mammal Laboratory, at Ehime University and at the Ocean Research Institute, University of Tokyo. These are based on comparative skeletal morphology, parasite faunas, pollutants and isoenzyme analyses. Members of the group suggested that the research might be broadened to include studies of mitochondrial DNA and pigmentation.

3.4.2 Population size

Alternative estimates of population size for the entire offshore North Pacific were presented in SC/35/SM12 and 27. It was noted that both are based on pelagic observations and that no new estimates are available for Japanese waters. The Bouchet estimate (790,000 to 1,738,000—SC/35/SM12) was based on surveys involving only trained observers, while only some of the observers used in the surveys yielding the Kato estimate (1,500,000 to 2,300,000 by the line-transect method—SC/35/SM27) received prior training in identification and sighting methods. Kasuya reported that while a Doi-method estimate was also presented in SC/35/SM27, the analysis uses parameters that should be adjusted for both typical behaviour of the animals and searching habits of the observers. This was not feasible in the present case.

Jones reported that while the estimate in SC/35/SM12 is a strip-census estimate, future analyses may employ the more generalized line-transect method. The group noted that the Kato estimate involves extrapolation to an area about 20% larger than that involved in the Bouchet estimate, accounting for much of the difference between the estimates. Several problems with the Kato estimate were pointed out. The Fourier series is not necessarily the best model to fit to a distribution of perpendicular distances which is spiked close to the transect line and may result in underestimation of abundance in this case. The estimate of variance of density of groups ($V(D_g)$, SC/35/SM27) is likely an underestimate because of the implicit assumption that groups are randomly distributed. Judging from the data in SC/35/SM12 and 18, this would appear to be unjustified. Effort was unevenly distributed because of the nature of the sample, possibly leading to a bias in the estimate. This could be avoided by stratifying the range in such a fashion that survey effort is uniformly distributed in each stratum. The group discussed the effect of adverse sighting conditions. Although the Bouchet analysis used only sightings made at Beaufort-4 conditions or better, the effect of weather (described in SC/35/SM10) may still have been to cause an underestimation of abundance, because the strip-census method assumes that all animals within the strip are seen.

The group also discussed the problem of attraction of cetaceans to survey vessels. If Dall's porpoises approach vessels more than they avoid them, then the line-transect method can be expected to yield overestimates of abundance. In an experiment involving observations from a helicopter (SC/35/SM13), animals approached the vessel more often than they moved away from it, but the results were inconclusive because of small sample size. To complicate things further, the results presented here (SC/35/SM10) indicate that there may be geographical and seasonal variation in the way this species reacts to ships. The group agreed that this is a paramount problem that must be solved before the line-transect method can be used with adequate confidence.

Another problem with the estimates is that both involve extrapolation to very large areas that have received very little or no survey effort. This can lead to extreme error, most likely in the direction of overestimation, and should be taken into account in making use of the estimates. Jones and Kasuya both stated that data collection and analyses are continuing.

3.4.3 Catches

The sub-committee examined document SC/35/SM28, listing the reported incidental take since 1978 in the land-based and mothership salmon drift-net fisheries, and SC/35/SM8 on the estimates of the take based on data collected by observers and the mothership fishery. Kasuya provided summaries from Japanese progress reports on take since 1963 by the Japanese coastal harpoon fishery.

The sub-committee noted with concern that the 1982 catch by the harpoon fishery boats was 12,833 animals, an increase of 3,030 from 1981 and the largest directed catch ever made in this fishery. It was suggested that the increase was a result of some boats staying at some distance from port for longer periods to economize on fuel. Another possible reason is a decrease in the drive-in catch of striped dolphins, *Stenella coeruleoalba* (from 4,783 in 1981 to 1,994 in 1982—SC/35/ProgRep Japan and *Rep. int. Whal. Commn* 33:213-20).

Odate and Ito presented statistics on the reported kill in the mothership salmon gillnet fishery (SC/35/SM28) of 1,000 for 1980, 1,361 for 1981 and 3,190 for 1982. These are lower than the estimates of incidental take based upon observer data presented by Jones (SC/35/SM8) of 8,970, 2,862 and 5,903.

Upon discussion, it was agreed that the doubling of kill from 1981 to 1982 most likely reflects a shift in distribution of areas of high porpoise density or shifts in fishing areas,

because fishing effort did not change substantially.

Balcomb reported that there is an unreported incidental catch of Dall's porpoises in gillnets in Washington State, USA.

3.4.4 Vital rates

The sub-committee noted that the available data for the pelagic drift-net catches show a very high annual pregnancy rate (90–95%) and that age-determination studies point to a much lower age (3.3 years in females) at attainment of sexual maturity than was found by Kasuya (6.8 years—1978) in the inshore harpoon fishery samples. The important question to be asked is if these are real characteristics of the population, or artifacts due to biased catches or significant segregation by age or sexual condition. SC/35/SM10 suggests that some segregation does occur. The authors concluded that (1) females in the state of late pregnancy, lactation, or pregnancy and simultaneous lactation are mainly distributed in the northern part of the area surveyed, and that (2) the southern part of the area is mainly occupied by males and some few females not accompanied by calves. This result indicates that not all females become pregnant every year. The predominant calving interval appears to be one year, implying a relatively high gross reproductive rate. Concerning age at attainment of maturity, Jones reported that research continues on the age-determination method and that the samples are being re-analyzed. In addition, large samples from 1981 and 1982 have not yet been examined.

The sub-committee also discussed the drop in pregnancy rate coincident with increase in lactation rate and number of corpora albicantia (SC/35/SM9, Table 7). A change in breeding season or lower fecundity with age and higher pregnancy rates in females which have matured in the last few years were discussed as possible contributing factors, but no conclusions could be drawn at this time. Jones reported that research on this question continues.

Males in the population involved in the salmon fishery attain sexual maturity at 5–6 years (maturity is reached at 8.1 years on average in the Japanese population—Kasuya, 1978). Length of gestation and lactation are not known but are thought to be relatively short (SC/35/SM9).

3.4.5 Status

According to SC/35/SM28, an increase in catch-per-unit-effort over the last 20 years suggests an increasing population. Kato (SC/35/SM27), however, thinks that the annual variation in his population estimates is due to incomplete coverage of the research area. It was also noted that the CPUE figures for the research vessels were based on a very small number of animals taken each year. The group agreed that the data do not provide evidence of an increase in abundance. Jones reported that the last assessment of status by the USA was in 1981, based primarily on data from 1978 and 1979. A new assessment will be carried out in early 1987. The 1981 assessment assumed a net recruitment rate like that of *Stenella* spp. in the eastern tropical Pacific, which have calving intervals of roughly two years. It also assumed a catch of one animal per net set, which is at the high end of the recorded range of values. The assessment is thus conservative with regard to these factors. The very important question of stock identity, however, remains unresolved.

Kasuya reported that complete effort data are not available for the harpoon fishery off Japan and that the status of the porpoise population there is unknown. Collection of biological specimens from the fishery has begun.

3.4.6 Gear research

Vessels using experimental acoustic devices (hollow monofilament line or pingers attached to the nets) have reported a 40% reduction in incidental kill of porpoise (SC/35/SM28), but evaluation of the data is in progress. Jones reported that under agreement between the USA and Japan, 25% of mothership-fleet vessels fishing in 1984 will be required to employ the devices. Fifty percent must be equipped in 1985 and 75% in 1986. Experimental work with pingers of various frequencies and hollow-line nets continues, as do efforts to record the sound emissions of Dall's porpoise at sea and in captivity. Doubts were expressed by some members of the group about high-frequency (c. 140 KHz) generators in such work because of (a) the rapid attenuation and (b) possible attraction to the devices. Others, however, felt that the latter was unlikely to be a serious problem.

3.4.7 Recommendations

(1) The studies to examine population identity should be broadened and given high priority and the research on attraction to vessels continued.

(2) Considering the large and increasing take by harpoon, Japan should be advised to institute a system for collecting effort data and to carry out a sighting survey to estimate abundance.

(3) The Soviet Union should be advised to analyse and make available sightings data from the Kurile Islands area of the Sea of Okhotsk (the porpoises that are fished off Japan migrate to Soviet waters in the summer).

3.5 Finless porpoise, *Neophocaena phocaenoides*

No significantly new information on this species was available to the sub-committee. Kasuya noted that the statistics on incidental catches by fishermen in the Inland Sea are not presently fully reported in the Japanese Progress Reports because specimens are discarded rather than taken to the markets. Two live-captures were noted in Java (SC/35/SM2). Almost nothing is known of population identity, size or status. Semi-isolated riverine populations may exist.

The sub-committee agreed that any research or baseline data collection would be useful since so little is known about this species. Member nations, for example India and the People's Republic of China, should be encouraged to collect catch statistics and make them available to the Scientific Committee.

4. REVIEW OF POPULATIONS INVOLVED IN LIVE-CAPTURE FISHERIES

The Committee reviewed documents available to it on live-capture fisheries (SC/35/SM2, 3, 4, 5, 14, 22, 26, 29, 30, 31, 32 and SC/35/ProgReps Iceland and USA). Authors present briefly reviewed the methods, findings and limitations of their contributions. Data on live captures by species and area are summarized in Appendix 3.

Data on catches for aquariums in Indonesia (SC/35/SM26) and Hong Kong (SC/35/SM3) were summarized directly from institution records and are regarded as accurate for the approximately one decade each has existed.

Reporting by the USA is probably close to complete for the years since 1972, but the coverage for earlier years is piecemeal (SC/35/SM4).

Records for Japanese live-captures are similarly regarded as more complete after 1973 (SC/35/SM26).

Reports of takes for European institutions are incomplete, as they are based on partial response to questionnaires. Only 36% of the institutions and individuals queried responded (SC/35/SM29). In several instances minimum takes known from publications or other sources were difficult to reconcile with the takes reported.

Data reported for South America are only minimum estimates of removals by live capture for two species (*Inia geoffrensis* and *Sotalia fluviatilis*) no longer sought in appreciable numbers, but listings are thought to be complete for *Cephalorhynchus commersonii*, in which there may be increasing interest (SC/35/SM30).

Records for New Zealand institutions reportedly lack only a few reports by attending veterinarians concerning previous holdings of several smaller institutions now closed (SC/35/SM32). Data presented for Australia reflect only present holdings (SC/35/SM32) and do not include at least one specimen of *Orcaella brevirostris* known to have been held at Cairns and possibly also individuals of other species held previously. Although there is no central system of recording live-captures for Australia, more complete information on past catches could be obtained from state governments and the institutions themselves.

For South Africa, where records have been required since the initiation of the fishery in 1961, there are good data available on all 59 specimens live-captured. Animals previously were housed at commercial aquariums (2) or research oceanariums attached to institutes (2), but present holdings are distributed, as a policy decision, only at the latter (Ocean Research Institute in Durban and Port Elizabeth Museum) rather than at commercial aquariums, and export is now prohibited.

In reviewing the live-capture data and possible impacts on populations, the group agreed to include only live and 'healthy' animals removed from the wild (through deliberate live-capture, drive fisheries, or accidental entanglement/entrapment) and to ignore stranded cetaceans recovered from the beach, regardless of their subsequent captive histories.

Captive births have been reported for *Tursiops truncatus, Grampus griseus, Orcaella brevirostris, Phocoena phocoena, Neophocaena phocaenoides, Inia geoffrensis, Orcinus orca* and *Stenella longirostris.*

After a brief review of the 32 species known to have been collected live, the group agreed to focus on 16 species for which the combined factors of stock identity, population size and status, takes (including all directed and incidental takes) and legal status and management seem to justify more intensive review. The sub-committee then broke up into four sub-groups which collated, examined and summarized information on the 16 species in the meeting documents and in the available literature. The full sub-committee then reviewed the results of this exercise and pared the list of species down to 5 for which concern and recommendations would seem to be justified in the case of one or more populations:

killer whale, *Orcinus orca*;
bottlenose dolphin, *Tursiops truncatus;*
short-finned pilot whale, *Globicephala macrorhynchus;*
tucuxi, *Sotalia fluviatilis;*
Commerson's dolphin, *Cephalorhynchus commersonii.*

4.1 Killer whale, *Orcinus orca*

4.1.1 Population identity

Killer whales occur worldwide with greatest abundance within 500nm of shore in cold waters of both hemispheres to the polar ice caps. Stocks in each ocean are presumed separate and distinct. For at least inland marine waters of Washington and British Columbia, there is good evidence for a high degree of isolation of coastal populations, suggesting that broader-scale units as used for larger species may be inappropriate for killer whales (*Rep. int. Whal. Commn* 32: 117).

Live captures have been made in or are planned at present for only 5 areas (in Washington, British Columbia, Alaska, Japan and Iceland), which can be presumed to be parts of ranges of populations that are separate and distinct from one another.

4.1.2 Population size

SC/35/SM7 presents data on present day killer whale distribution and abundance in Southeast Alaska (from Alaska Trollers Association logbooks, 1976–1982), Prince William Sound (from surveys 1976–78, vessel surveys 1976/1981), Shelikof Strait (from surveys, 1982–83). Data for all these areas were also collected through interviews. Minimum counts are 93, 80 and 66, and minimum estimates are 93, 100 and 100 for the 3 areas, respectively. A minimum count of 284 has been made for Iceland (SC/35/SM31 discussed below in Item 7) and an estimate of 303 made for British Columbia (Bigg, Macaskie and Ellis, 1983). There are no estimates for populations in Japanese waters.

4.1.3 Catches

Live capture of this species for display commenced in 1964 with a male taken in British Columbia. From 1964 to 1976, approximately 58 animals were removed from inland marine waters of Washington/British Columbia for exhibit (Bigg and Wolman, 1975; Asper and Cornell, 1977). A few additional whales died in capture operations. Others were captured and released. There is no other known exploitation of the population in these areas. Live-captures in Japanese waters began in 1973. Through 1982 a total of 9 animals had been removed (SC/35/SM26). Killer whales in Japan formerly were taken for human or animal food and for oil and by-products. Ohsumi (1975) reported catches of 1,477 from 1948 to 1972, and Miyazaki (1982) reported takes of 12 from 1976–1981, of which 10 were caught in drive fisheries and 2 by small-type whaling. Some of these were taken to aquariums. The species continues to be taken in small numbers in drive fisheries (4 in 1982), and fixed nets (1 in 1982) (SC/35/ProgRep Japan).

Since they began in 1976, live-capture operations in Iceland have resulted in removals of 39 animals; two died in captivity in Iceland and 37 were exported. An additional 7 were captured but released (SC/35/SM31; Sigurjónsson, 1983). Icelandic populations formerly were exploited by a Norwegian fishery which took 300 animals from Icelandic waters (many well offshore) between 1955 and 1972 (Jonsgård and Lyshoel, 1977; Christensen, 1982), while between 1955 and 1960, killer whales were the target of kills to reduce competition with the herring fleet. Total kills in this effort are unreported.

4.1.4 Status and management

Nothing is known of the status of killer whale populations involved in live-capture operations.

The United States Marine Mammal Protection Act of 1972 requires that all 'takes' of cetaceans in US waters, including live-captures, be authorised by permit. No such permit has been issued for the taking of killer whales since 1976, but Perrin reported that one application is pending for 'removal' for live maintenance of up to 10 whales from Alaska over 5 years and encirclement, handling and release for scientific study of up to 90 whales off Alaska and California over 5 years. A permit system for live captures also exists in Canada, where 1 permit was issued in 1983 to take 2 killer whales from British Columbia for exhibit. That permit has been retained unused, as three whales were requested to be imported from Iceland in May 1983. A permit system for live-captures also exists in Iceland, where 15 permits have been issued for the taking of a total of 62 whales (SC/35/SM31).

Considering the relatively low levels at which killer whales have been exploited world-wide, the species cannot be considered endangered. However, to the extent that stocks are localized and isolated, any exploitation of them can be expected to have long-term impacts on population size and structure (*Rep. int. Whal. Commn* 32: 59). Because of the possibly very low rate of reproduction in this species in at least some populations, if a guideline for rate of removals is adopted pending stock assessment, as has been done by the US (see *Tursiops* below), it should probably be lower than the annual rate of 2% that has been used for *Tursiops*.

4.1.5 Recommendation

Mindful of the probability that populations in a given geographical area consist of localized stocks, the sub-committee recommends that any planned live-captures by the USA, Iceland and Japan or elsewhere be preceded by an assessment of size and composition of the populations to be affected.

4.2 Short-finned pilot whale, *Globicephala macrorhynchus*

4.2.1 Population identity

The species is distributed world-wide in tropical and lower-latitude temperate waters, but live-captures are reported only for the North Pacific (SC/35/SM4, 26). Mitchell (1975, ed.) reported indications that there are two forms in the North Pacific (defined during the meeting by Kasuya for Japanese waters as a larger northern and a smaller southern form) and said that both are probably fished off Japan.

4.2.2 Population size

There are no published estimates of population size for the North Pacific, but the species is not considered rare.

4.2.3 Catches

This has long been a popular display animal in the United States (SC/35/SM4). Twenty animals were caught off Hawaii between 1963 and 1972. All 17 catches since 1972 and undetermined numbers live-captured between 1966 and 1972 (including at least 33 (Walker, 1975) but thought to total 50–100 animals — reported by Leatherwood) were from Californian waters. Perrin reported that tens of animals were taken annually in gill nets and round-haul nets off Southern California. Research toward an assessment of this population is in progress.

In the Western Pacific the species has been taken for live display from the drive fishery at Taiji, Japan, which has operated sporadically since at least the mid–1960's but has kept data on live removals only since 1969. From 1969–1982 the total commercial and incidental take, from Taiji and elsewhere, was 3,009 (Miyazaki, 1983, p.624; SC/35/ProgRep Japan), including small numbers of the larger form taken by small-type whaling (reported by Kasuya).

4.2.4 Status and management

There is no indication that the low levels of removal off California have affected the species there, but the population has not been assessed. Japanese live captures are unlikely to have a significant effect on the population(s) by themselves, given that they represent only about 2% of the mean annual catch from 1973 to 1982 and about 5% from 1976 to 1982 (SC/35/ProgRep Japan and SC/35/SM26), but members of the sub-committee expressed concern about the size of the aggregate catch given that the population has not been assessed. Kasuya reported that maximum catch limits are set by local governments.

4.2.5 Recommendations

(1) In view of the aggregate catch of the small form in Japanese waters, Japan should be advised to assemble available information and data relevant to a possible assessment and make the material available to the Scientific Committee for review.

(2) The USA should be encouraged to make a progress report on its assessment of eastern North Pacific population(s) available to the Scientific Committee.

4.3 Bottlenose dolphin, *Tursiops truncatus*

4.3.1 Population identity

The species is found world-wide in temperate and tropical waters, near-shore and offshore. In most areas studied there is a smaller form and a larger form (Mitchell, ed., 1975), although distinctions between them are not well described. From detailed studies of local populations involved in US live-capture fisheries (Odell and Asper, 1982; Asper and Odell, 1980; SC/35/SM22) it is clear that at least coastal animals are distributed in populations occupying separate but overlapping sections of ocean coastline and associated inland marine waters. Live-capture operations conducted to date in most areas have exploited such coastal populations.

4.3.2 Population size

Although the species appears common in much of its range, there are estimates of numbers available for only one region in which live captures occur at present. SC/35/SM22 presents estimates for sub-populations/management units of the southeastern USA obtained from systematic or random aerial surveys using strip or line-transect techniques. Estimates of sizes of regional/local populations range from 35 (Apalachicola/St. Joseph Bays) to 1,342 ± 847 (Mississippi, Chandleur and Breton Sounds).

4.3.3 Catches

In terms of numbers of populations from which animals are collected and total takes world-wide, this is the most important species of cetacean to live-capture fisheries.

Live-captures in many areas (e.g. Australia, Mexico, New Zealand, Indonesia and the Mediterranean) have involved small numbers over relatively long periods, but from the United States an estimated minimum of 1,595 to 1,635 dolphins of this species (1,578–1,613 from the southeastern USA) have been taken since 1914 (Leatherwood and Reeves, 1982; SC/35/SM4). Although there are no other takes reported for US waters, wherever the species occurs sympatric with net fisheries around the world some incidental mortality takes place and such kills can be supposed to occur in the USA.

In Japanese waters, a total of 580 dolphins of this species has been taken for live display since 1974 (SC/35/SM26). Most (93%) were taken from drive fisheries at Taiji and Iki or from incidental catches by other fisheries. The remainder were intentionally sought and captured by aquarium staff or contracted fishermen/collectors. In addition to the live captures, in 1982 alone, 834 were reported killed in drive fisheries and fixed nets (SC/35/ProgRep Japan). Miyazaki (1982) reported that a total of 6,827 dolphins of this species were taken between 1976 and 1981 (ave = 1,138), by driving (6,350), set net (254), harpoon (213), and small type whaling gillnet (10).

Though numbers reported taken by live-capture off Australia are low (28+), there may be some additional mortality in shark nets in the same areas where live capture takes place (Paterson, 1979).

The sub-committee is aware of additional unreported live captures of this species from the Black Sea, the southeastern Philippines, the South China Sea, the Strait of Malacca, and Western Malaysia.

4.3.4 Status and management

Although there is at present no basis for concern that live-capture fisheries have had a detrimental effect on the species overall, there is concern that in the long term, sustained takes from localized populations may have had significant impact. The sub-committee notes the US government's committment to an interim management programme, in which population numbers are being estimated for regional stocks/management units and takes of no more than 2% of the minimum estimated population per year are being permitted in each stock (SC/35/SM22).

Leatherwood reported that increasing numbers of this species are born alive at oceanariums and can, in the future, be expected to reduce the burden on free-ranging populations to supply captive needs.

4.3.5 Recommendations

(1) The sub-committee feels the guideline for takes pending stock assessment of 2% per year to be prudent and believes that it can be safely followed pending results of other assessments. It recommends that continuation of research on stock identity by the US be encouraged, and that population census and interim management procedures be initiated for on-going or planned live-captures of this species elsewhere.

(2) In view of the aggregate take of this species in Japan, the sub-committee recommends that Japan be advised to at least determine the stock identity and abundance of the populations impacted.

(3) The sub-committee recommends that the Australian government be advised to make an effort to identify to species the small cetaceans taken incidentally in anti-shark nets and include the information, as well as live-capture data, in its progress report to the Scientific Committee.

4.4 Tucuxi, *Sotalia fluviatilis*

4.4.1 Stock identity

At least two separate populations exist, one freshwater and the other coastal marine. The coastal marine dolphins are larger than the freshwater animals. Nothing is known about populations within the river systems or along the coast.

4.4.2 Population size

No data are available.

4.4.3 Catches

Since the mid-1960s over 45 dolphins have been taken from South America (mainly Colombia) in the live-capture fishery. A small number were also taken live in Brazil. No incidental catches are known from Colombia. Recent incidental catches are known from Brazil (Best and da Silva, in press).

4.4.4 Status and management

Nothing is known about the status of this species. It is listed in Appendix 1 of CITES. The European nations into which the animals have been imported are parties to CITES and must issue permits for import. Colombia, the principal nation of export, is also a party to CITES.

4.4.5 Recommendation

Brazil should be advised to collect, and provide in its progress report to IWC, statistics on the number of dolphins taken incidental to other fisheries and to collect information on basic life-history parameters from these animals.

4.5 Commerson's dolphin, *Cephalorhynchus commersonii*

4.5.1 Stock identity

This species is found in coastal waters of Argentina from Peninsula Valdes (*ca* 42°05'S) to southern Tierra del Fuego and the Strait of Magellan; it is also found around the Falkland Islands, South Georgia and Kerguelen Islands. The island population(s) are certainly separate from one another and from those on the coast of Argentina. Coastal populations appear localised, for example near river mouths.

4.5.2 Population size

Estimates are unavailable.

4.5.3 Catches

Since 1978, a total of 24 animals have been taken from Argentine waters in the live-capture fishery (20 from Commodoro Rivadavia and Puerto Deseado). No incidental catches are known from the regions of capture.

4.5.4 Status and management

Status is unknown.

4.5.5 Recommendations

The demand for live specimens, most likely from Argentine waters, will probably continue. Argentina should be advised to monitor removals by capture area (because of the apparently localised coastal populations) and to review coastal fisheries to determine if there is an incidental take. Carcasses should be salvaged to provide basic life-history data and specimens.

5. REVIEW OF NEW DATA AND ANALYSES FOR BAIRD'S BEAKED WHALE

At the meeting of the Scientific Committee in 1982, the sub-committee reviewed an analysis of catch and sightings data concerning the Japanese coastal fishery for Baird's beaked whale. The sub-committee expressed concern that the catch-per-unit-of-effort analysis could not be evaluated because the nature of the fleet had varied over the period of analysis and that the hiatus in scouting boat sightings data off the coast of Japan might indicate more than one stock. The sub-committee recommended that the catch and sightings data be reanalysed to take account of the problems with effort, that the scouting vessel sightings data be reanalysed to try to determine stock ranges, that additional research be carried out to determine stock ranges, possibly by use of aerial surveys or tagging, and that population dynamics be investigated.

The government of Japan set a national quota of 40 whales for the 1983 season. The catch in 1982 was 60 whales, 21 more than in 1981.

This year, the sub-committee was pleased to receive document SC/35/SM25 describing a re-analysis of the catch and sightings data and to note that there are two Japanese sighting and tagging cruises using Japanese tags taking place this year in June–August with Baird's beaked whale the primary target and that aerial survey data collected from coastal waters in previous years will be reanalysed.

Kasuya summarised SC/35/SM25, noting that the operational record of the fleet has been analysed over the period 1947–1982, that the sightings records from scouting boats had been re-analysed by month, and that a detailed analysis of the data for Area D had been done for 1977–1982. SC/35/SM25 showed that a regression of catch/boat/month for July and August on year from 1947 to 1982 was not significantly different from zero for fishing vessels of less than 40 gross tonnes, greater than 40 gross tonnes or for the combined data using a correction ratio to account for vessel size. The sub-committee noted that there is yearly variation in the length of the fishing season within these two months and that this introduces variability into the CPUE series which could possibly be masking a trend. However, there are no data on dates of beginning and end of fishing within the first and last months of the season, respectively, prior to 1977. On the question of correcting the data for the marked increase in vessel size from 1947 to 1974, the sub-committee noted that it would be useful to investigate the data for 1965–68, the only period of appreciable overlap in the operation of the smaller and larger vessels. Two separate analyses of the catch-per-month data for the six vessels operating during this period were carried out by Holt and by Kasuya and Miyashita. The sub-committee was unable to resolve the different results and conclusions of these analyses, and concluded that analyses of more detailed data were necessary. Holt stated that he considered the CPUE analysis in SC/35/SM25 to be methodologically invalid. The sub-committee noted that the more detailed data available in recent years showed no trend in sightings per operational hour from 1977 to 1982.

SC/35/SM25 concluded, based on changes in the distribution of sightings from scouting boats from month to month, that the range of Baird's beaked whales found in Japanese coastal waters was probably continuous with that of the animals seen in the rest of the North Pacific but that further study was needed. The sub-committee considered that the effort expended by the scouting boats in the waters off the coast of Japan was insufficient to draw any firm conclusions. The results from the Japanese sightings cruises this year may provide information which could help to resolve this problem.

Ohsumi and Kasuya stated that Baird's beaked whales were only taken by small vessels, certainly within 200 miles of the coast. Ohsumi also noted that the increased effort and resulting high catch in 1982 was probably a response to an increased demand for whale meat in Chiba (adjacent to Area D).

In conclusion, the sub-committee noted that there are still problems with measurement of effort precluding an evaluation of data currently available for 1947–1976, and that detailed data on catch/boat/month for each fishing vessel in each year are required in order to resolve this problem. In addition, the sub-committee noted that the questions of stock identity and range are unresolved.

Recommendations

The sub-committee recommends that research on effort measures and stock identity continue and that the available effort and catch data by boat and by month be made available to next year's meeting of the Scientific Committee.

6. REVIEW OF NEW INFORMATION ON BLACK SEA DOLPHIN AND PORPOISE POPULATIONS AND FISHERIES

The Turkish Government has issued a decree banning dolphin and porpoise hunting in the Black Sea starting in mid-April, 1983, for at least one year. Rifles and ammunition used in the hunt are being confiscated.

The sub-committee reviewed the Black Sea populations and fisheries last year and made several recommendations, some of which have been acted on. The recommendations and present status (in parentheses) follow. The group recommended

(1) that improvement in harvest statistics be made, with the help of FAO (FAO this year sent a general fishery mission to Turkey which among other activities procured information on the dolphins and porpoise);
(2) that the USSR make available data from its aerial sighting surveys in the eastern Black Sea (the data have not yet been made available);
(3) that Turkey be invited to send a scientist to this year's meeting of the Scientific Committee (Turkey was invited to send a scientist to this year's meeting, but did not accept the invitation, possibly because of funding problems);
(4) that the history and present status of the anchovy fisheries be investigated and the results made available to the Scientific Committee (no new information is available on the anchovy fishery); and
(5) that the catch of dolphins and porpoise be sampled to determine sex and size composition and reproductive condition of the animals (a research programme is to be initiated with advice and funding from international sources — informal FAO source).

The FAO mission obtained catch statistics for the three species in the aggregate for the period 1976 through 1981.

Year	Catch (mt)	Ave wt. (kg)	Est. no. individuals [1]
1976	1,590	40.6	39,162
1977	2,608	38.4	50,822
1978	1,907	36.4	52,390
1979	1,827	38.5	47,450
1980	2,721	53.3	37,150
1981	886	41.7	21,247
Total	11,539	—	248, 221 (Ave. 41,370)

[1] Catch in tons divided by ave wt.

An independent estimate of average catch during the period was based on consumption of rifle ammunition in the hunt. About 103,000 to 133,000 rounds were used annually. The dolphin hunters claim that about 1 shot out of 3 kills a dolphin. This implies an annual kill of about 34,000 to 44,000, a range that brackets the 10-year average estimate based on catch in tons (informal FAO source).

Recommendation

The sub-committee recommends that the scientist in charge of the Turkish research programme be invited (and funded by IWC, if necessary) to participate in the next meeting of the Scientific Committee, to present a progress report and to discuss plans for future research.

7. REVIEW OF NEW INFORMATION ON OTHER EXPLOITED SMALL CETACEANS

Because of the shortage of time due to major concentration on live-capture fisheries, review of Baird's beaked whale, and the review of exploited populations of phocoenids, the sub-committee only briefly reviewed new data on other small cetaceans, with the exception of the incidental catch of small cetaceans off Australia and killer whales.

7.1 Incidental catch of small cetaceans off Australia

Information on incidental catch of small cetaceans in a gillnet fishery for shark, tuna and mackerel in Northern Australian waters is summarised in SC/35/SM21. Gillnetting by vessels from Taiwan started in 1974. With the declaration of the Australian Fishing zone in November, 1979, the fishery came under Australian control, and Australian observers started to gather incidental catch data in 1980. The estimated total cetacean by-catch, including *Tursiops truncatus, Stenella longirostris, S. attenuata,* and *Pseudorca crassidens,* between June 1981 and February 1983 is 4,463 ± 1,550 animals. A linear-regression analysis of cetacean-catch rate against cumulative fishing effort shows a significant decline in catch rate over the 21-month period considered.[1] McNamara reported that plans are underway to study the incidental take in this fishery and collect biological specimens.

[1] Editor's note. Since the meeting this paper has been revised. The revised catch for June 1981–March 1983 is 4,577 ± 1,331. Linear regression analysis over this period reveals no significant decline. However if the 22-month period June 1981–March 1983 is examined (catch 4,662 ± 1,403) the decline in catch rate is significant.

7.2 Killer whales

P. Hammond summarised data in SC/35/SM17 on the density and number of killer whales in Antarctic Areas II, III, IV and V surveyed by the IWC/IDCR Minke Whale Assessment Cruises using line-transect sampling methods. In the area surveyed, the overall density and total number of killer whales was estimated to be 81 whales per 1000 sq. nm and 163,500 whales, respectively. Estimates for Areas III and IV supported Allen's (1981) opinion that his estimate was probably too high and that Best's estimate was probably too low. The estimates in SC/35/SM17 differ from those previously presented primarily in three respects. Firstly the data were 'smeared' in an attempt to reduce bias caused by rounding sighting angles to convenient values, particularly zero degrees; secondly, a more appropriate model was fitted to the data, and, thirdly, analyses showed that the data did not need to be stratified by area.

The sub-committee reviewed the data presented in SC/35/SM31 on killer whale sightings off Iceland during October 1982. Sigurjónsson attempted to determine the minimum number of killer whales present on the Icelandic herring grounds by distributing specially designed recording forms to fishermen. The highest 'minimum number' of killer whales was 284 animals on 15 October, 1982. The author suggested that the 'minimum number' is conservative, as only a small part of the Icelandic coastline was covered and the herring fishery occurred mainly within 10 nm of the coast. The author used 15 nm as the minimum distance between vessels on the same day before data were disregarded. Leatherwood noted that to obtain a count for a given day, in his survey (SC/35/SM7), the largest number in one area was used as a starting figure and that further sightings on the same day were only added if they were made at least 110 nm away. This is the longest estimated distance moved by any of 30 herds of killer whales tracked in Puget Sound (Balcomb, 1978).

7.3 Dolphins impacted incidentally by fisheries

A paper was available that was prepared for the annual meeting of the Standing Committee on Research and Statistics, International Commission for the Conservation of Atlantic Tunas (Coan and Sakagawa, 1983). The authors noted that the US tuna purse-seine fleet has operated in the Atlantic ocean since 1967. Major emphasis was on analysis of data from the eastern tropical Atlantic for the period 1967–1980. Dolphin sets were rarely made by US vessels operating in the eastern tropical Atlantic. The largest number of dolphin sets in one year was 26, off Liberia in 1967.

Hammond's paper SC/35/SM16 on dolphin mortality incidental to purse-seining for tunas in the eastern tropical Pacific for 1982 was noted but not discussed.

Notes on small cetaceans observed during an IWC/IDCR cruise in the eastern tropical Pacific were contained in SC/35/SM23.

Quiroga reported that the Spanish Institute of Oceanography has initiated an enquiry on the fleet of vessels that fish for tuna. The goal of this inquiry is to determine the extent of incidental capture of small cetaceans and the species captured. The first information collected is for the vessels that use nets. The fleet that uses trolling gear and live bait does capture some dolphins, which are used for food. It is still too early to estimate the quantity of these captures.

Records of pelagic dolphins in the Northern Indian Ocean Sanctuary, including incidental takes in net fisheries off Sri Lanka, were noted in SC/35/SM6.

7.4 White whales
SC/35/SM20 dealt with white whale distribution and migration in the Kara Sea but was not discussed.

7.5 Bottlenose whales
A paper on the history of the bottlenose whale fishery in the North Atlantic was available (SC/35/SM15) but was not discussed. Christensen reported that an expanded version will be submitted to the Committee next year.

8. OTHER BUSINESS

8.1 Takes of small cetaceans in 1982
Information on takes (directed, incidental and live-capture) available in the documents of the meeting or provided by participants is summarised in Appendix 4.

8.2 New information on the effects of pollution and industrial development
The progress reports of Australia, Denmark, France, Japan, New Zealand, Norway, Spain, USSR, UK and USA and papers SC/35/SM3, SM14, O 13, IWC/35/11A and 11E contain information on this subject. The Committee, however, was disappointed to note, yet again, that most information relates to levels of contaminents and not to possible effects. Only Australia, Denmark, France, USA and Canada appear to have such work in progress.

The 1982 ICES meeting reviewed the effects of pollution on marine mammals (IWC/35/11A). It was concluded that the levels of pollutants observed vary greatly with age, sex and location and that effects are complicated by interactions between direct metabolic effects and environmental interactions. Since no firm conclusions could be reached at that meeting on the effects of pollutant burdens on reproduction and survival of marine mammals, this will be a special topic for the 1983 meeting.

The FAO/UNEP Consultation on the Global Plan of Action for the Conservation, Management and Utilization of Marine Mammals made a number of recommendations for studies in the general area of effects of pollution and environmental change on marine mammals (Recommendations 8 and 9, IWC/35/11E).

8.3 Proposals for UNEP
UNEP has officially invited the sub-committee to undertake the development of proposals for the utilisation of funds (US $3 million) to be requested for research on small cetaceans. Guidance from the full Committee was not available in time for consideration of the request at this year's meeting of the sub-committee.

8.4 Advice to FAO concerning unreported incidental catches (see Item 8.5)

8.5 Priority topics for 1984 meeting
Because of an informal request from FAO for information on fisheries taking marine mammals incidentally but for which the mammal take is not presently reported in fishery statistics, and because of concern over the development of several new gillnet fisheries that possibly take small cetaceans, the sub-committee has decided to focus at the 1984 meeting on review of new and expanding fisheries that impact or may impact small-cetacean populations. The group also agreed to review the life histories, population biology and fishery involvement of the species of *Cephalorhynchus: C. hectori, C. heavisidii, C. commersonii* and *C. eutropia*. The sub-committee tentatively agreed to review exploited populations of pilot whales, *Globicephala melaena* and *G. macrorhynchus*, at the 1985 meeting.

8.6 Publication of documents
A list of documents to be considered for publication was submitted to the Editorial Board.

8.7 Review of small-cetacean research proposals
The sub-committee reviewed SC/35/RP8, 11 and 12.

SC/35/RP8 is not a fully developed proposal and its technical aspects cannot be adequately reviewed in its present form. The sub-committee can make two comments, however.

(1) Aerial survey is probably not the best census method for this species; members of the group pointed out that the water in the proposed survey area is often turbid and that the cochito, like the harbour porpoise, almost certainly travels in small groups and spends only a small proportion of the time at the surface (probably less than 10%), making it highly likely that animals would be missed from a plane.

(2) Mexican regulations concerning marine mammal research require that all research projects in Mexico be joint undertakings involving Mexican research entities and scientists. For this reason, the sub-committee recommends that the applicants approach the appropriate Mexican agency and explore the possibility of preparing a joint proposal for submission to the IWC. Perdomo noted that there is interest in Mexico in research on *P. sinus*.

The group feels that SC/35/RP11 should be evaluated by the sub-committee on protected species but support it in principle.

SC/35/RP12 is a revised and expanded version of SC/35/RP5 of last year's meeting. The sub-committee endorsed it then and reiterates the endorsement now, recommending that the proposed 1983 pilot project be funded.

8.8 Errors in IWS
The sub-committee again found extensive errors in the most recent edition of IWS (LXXXIX and XC) (see Appendix 5) and requests the Secretary to write to Mr E. Vangstein regarding these errors.

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Appendix 1

AGENDA

1. Participants, agenda and introductory remarks.
2. Review of documents.
3. Review of exploited populations of phocoenids.
4. Review of populations involved in live-capture fisheries.
5. Review of new data and analyses for Baird's beaked whale, *Berardius bairdii.*
   - 5.1 Refinement and reanalysis of CPUE data.
   - 5.2 Reanalysis of scouting vessel data.
6. Review of new information on Black Sea dolphin populations and fisheries.
7. Review of new information on other exploited small cetaceans.
8. Other business.
   - 8.1 Takes of small cetaceans in 1982 (appendix table).
   - 8.2 New information on the effects of pollution on small cetacean populations.
   - 8.3 Proposals for UNEP.
   - 8.4 Advice to FAO concerning unreported incidental catches.
   - 8.5 Priority topics for 1984 meeting.
   - 8.6 Publication of documents.
   - 8.7 Review of small cetacean research proposals.
   - 8.8 Errors in IWS.

Appendix 2

LIST OF DOCUMENTS

Documents in the SM series are listed on pp. 68–9 of this volume.

Appendix 3

SUMMARY OF AVAILABLE LIVE-CAPTURE INFORMATION

Documented takes of small cetaceans by live-capture fisheries, shown by species and area. Included are animals reported deliberately caught, selected from drive fisheries, or recovered as accidentally entangled/entrapped in fishing gear. Totals do not include animals released on the day of capture.

Footnotes to all Tables

(1) Catches are grouped by broad geographical regions. Such reporting is not meant to imply definitions of populations or stocks.
(2) US records are known to be incomplete. Reliable records have been kept since 1973. Limited data are published or were otherwise available to the sub-committee on known takes prior to 1973.
(3) From SC/35/SM4 Table 6, admittedly only a partial listing. This species has been captured live since about 1861; records should reflect sporadic takes over 121 years.
(4) Reporting period 1973–1982.
(5) From SC/35/SM32 which contains only current holdings for 6 dolphinariums currently operating and does not report previous holdings of these or any captures for at least three other institutions (Cairns, Tweed Heads and Taronga Zoo) (reported by McNamara).
(6) At least 1 individual not reported in SC/35/SM32 was known to have been held at Cairns in the past (reported by Leatherwood).
(7) Includes four released alive within two weeks (SC/35/SM3).
(8) Whereas one is reported to be held in captivity SC/35/SM32, 2 were captured and removed (reported by McNamara).
(9) Dispute exists over exact number of removals (see Bigg and Wolman, 1975; Asper and Cornell, 1977). Includes all captures of *O. orca*, from the Pacific Northwest, as data to separate them were unavailable to the Committee.
(10) Includes 37 exported and two which died in captivity in Iceland.
(11) Includes all recorded captures 1973–1982 and records for one collecting institution 1966–1973 (Walker, 1975). Data were unavailable on other known collections.
(12) Includes one animal noted 'released' but time period not specified (SC/35/SM4).
(13) Reported as *T. aduncus*—different, unresolved total numbers from SC/35/SM2 and SM26, respectively.
(14) Includes 652 listed as *Tursiops truncatus* (1968–1982) and 45 as *T. aduncus* (1973–1982).
(15) Likely an underestimate.
(16) Reporting period 1968–1982.
(17) Includes eight reported as 'escaped' or 'released' but unspecified times after capture and numbers of each.
(18) Includes estimated 1,578–1,615 taken 1914–20 Mar. 1980 (Leatherwood and Reeves, 1982) and about 44 taken in 1980–82 (SC/35/SM4).
(19) Includes 79 animals caught live as fishery by-catch and two intentionally netted (SC/35/SM14, 29).
(20) R-J. Liu, Cambridge University, pers. commn. 1 July 1983.
(21) From Kasuya (1972).
(22) Including 4 (SC/35/SM29) + 3 (SC/35/SM4) + 2 (Pilleri, 1974) + 1 (reported by Brownell).
(23) Does not include takes from Washington (see Note 24).
(24) Includes all animals taken in waters of Washington State and British Columbia, as data to separate them were unavailable to the Committee.

Table 1

Summary table of known live-captures by species and continent.

	The Americas	Asia	Australasia	Africa	Indian Sub-cont.	Europe	Unknown	Total
Ziphius cavirostris	1	—	—	—	—	—	—	1
Monodon monoceros	7	—	—	—	—	—	—	7
Delphinapterus leucas	104–5+	1	—	—	—	—	2	107–8+
Steno bredanensis	17	5	—	—	—	~11	—	~33
Sotalia fluviatilis	45	—	—	—	—	—	—	45
Sousa chinensis	—	2	2+	—	—	—	—	4+
Sousa teuszii	—	—	—	3	—	—	—	3
Orcaella brevirostris	—	16	1	—	—	—	—	17
Peponocephala electra	2–3	12	—	—	—	—	—	14–15
Feresa attenuata	3	—	—	—	—	—	—	3
Pseudorca crassidens	11+	5	2	—	—	—	—	18+
Orcinus orca	58–66	9	—	—	—	39	1	107–115
Globicephala macrorhynchus	70	156	—	—	—	—	—	226
Lagenorhynchus albirostris	5	—	—	—	—	—	—	5
Lagenorhynchus obscurus	—	—	22–24	23	—	—	—	45–47
Lagenorhynchus obliquidens	79	238	—	—	—	—	—	317
Lagenodelphis hosei	—	16	—	—	—	—	—	16
Tursiops truncatus	1,732–69+	773–87	32+	23	—	6	64	2,630–81+
Grampus griseus	1	50	—	—	—	1	—	52
Stenella longirostris	85+	10	—	—	—	—	—	95+
Stenella attenuata	62+	69	—	—	—	—	—	131+
Delphinus delphis	37+	1	28	—	—	24	—	90+
Lissodelphis borealis	9	—	—	—	—	—	—	9
Cephalorhynchus hectori	—	—	4	—	—	—	—	4
Cephalorhynchus commersonii	24	—	—	—	—	—	—	24
Phocoena phocoena	occasional	1	—	—	—	81+	—	82+
Phocoenoides dalli	8+	8+	—	—	—	—	—	16+
Neophocaena phocaenoides	—	107	—	—	—	—	—	107
Platanista gangetica	—	—	—	—	7	—	—	7
Platanista minor	—	—	—	—	10	—	—	10
Inia geoffrensis	100+	—	—	—	—	—	—	100+
Total	2,460–2,507+	1,479–1,493+	91–94+	49	17	162+	67	4,325–4,387+

Table 2

Summary table of live-captures in the Americas.

	United States[2]					Canada		Central and S. America			
	Hawaii	Alaska	NE coast	Southeast	Pacific	West coast	E and NE coast	Mexico	North east	Argentina	Total
Z. cavirostris	—	—	—	—	1	—	—	—	—	—	1
M. monoceros	—	—	—	—	—	—	7	—	—	—	7
D. leucas	—	10+	—	—	—	—	94–95[3]	—	—	—	104–5+
S. bredanensis	17	—	—	—	—	—	—	—	—	—	17
S. fluviatilis	—	—	—	—	—	—	—	—	45	—	45
P. electra	2–3	—	—	—	—	—	—	—	—	—	2–3
F. attenuata	3	—	—	—	—	—	—	—	—	—	3
P. crassidens	10+	—	—	—	1	—	—	—	—	—	11+
O. orca	—	—	—	—	—	58–66[9]	—	—	—	—	58–66
G. macrorhynchus	20	—	—	—	50[11]	—	—	—	—	—	70
L. albirostris	—	—	—	—	—	—	5	—	—	—	5
L. obliquidens	—	—	—	—	79[11]	—	—	—	—	—	79
T. truncatus	34[12]	—	?	1,622–59[18]	18+[11]	—	—	58	—	—	1,732–69+
G. griseus	—	—	—	—	1	—	—	—	—	—	1
S. longirostris	85+[17]	—	—	—	—	—	—	—	—	—	85+
S. attenuata	47	—	—	15+	—	—	—	—	—	—	62+
D. delphis	—	—	—	?	37+[11]	—	—	—	—	—	37+
L. borealis	—	—	—	—	9[11]	—	—	—	—	—	9
C. commersonii	—	—	—	—	—	—	—	—	—	—24	24
P. phocoena	—	← occasional →			—	occasional	—	—	—	—	occasional
P. dalli	—	—	—	—	8+[11]	—	—	—	—	—	8+
T. geoffrensis	—	—	—	—		—	—	—	100+	—	100+
Totals	218–19+	10+	?	1,637–74+	204+[23]	58–66[24]	106–7+	58	145+	24	2,460–507+

Table 3

Summary table of live-captures in Asia (excluding the Indian sub-continent).

	Indonesia						People's Republic of China	Total
	Java	Borneo	Philippines	Japan	Taiwan	Hong Kong		
D. leucas	—	—	—	1[4]	—	—	—	1
S. bredanensis	—	—	—	5[4]	—	—	—	5
S. chinensis	—	—	—	—	—	2	—	2
O. brevirostris	—	16	—	—	—	—	—	16
P. electra	—	—	10[7]	2[4]	—	—	—	12
P. crassidens	—	—	—	5[4]	—	—	—	5
O. orca	—	—	—	9[4]	—	—	—	9
G. macrorhynchus	—	—	—	156[4]	—	—	—	156
L. obliquidens	—	—	—	238[4]	—	—	—	238
L. hosei	—	—	16	—	—	—	—	16
T. truncatus	16	14–28[13]	—	697[14]	45	1	—	773–87
G. griseus	—	—	—	50[16]	—	—	—	50
S. longirostris	9	—	1	—	—	—	—	10
S. attenuata	—	—	—	69[4]	—	—	—	69
D. delphis	—	—	—	1[19]	—	—	—	1
P. phocoena	—	—	—	1[4]	—	—	—	1
P. dalli	—	—	—	8+[4]	—	—	—	8+
N. phocaenoides	2	—	—	94[19]	—	—	11+[20]	107+
Totals	27	30–44	27	1,336+	45	3	11+	1,479–93+

Table 4

Summary table of live-captures in Europe.

	Mediterranean Sea	Adriatic Sea	Western Europe	Denmark	Iceland	Total
S. bredanensis	~10	—	1	—	—	11
O. orca	—	—	—	—	39[10]	39
T. truncatus	2	2	2	—	—	6
G. griseus	1	—	—	—	—	1
D. delphis	22	—	2	—	—	24
P. phocoena	—	—	—	81+	—	81+
Total	~35	2	5	81+	39	162+

Table 5

Summary table of live-captures for the rest of the world.

	India and Bangladesh	Pakistan	South Africa	New Zealand	Australia	Total
S. chinensis	—	—	—	—	2+[5]	2+
S. teuszii	—	—	3	—	—	3
O. brevirostris	—	—	—	—	1[6,5]	1
P. crassidens	—	—	—	—	2[8,5]	2
L. obscurus	—	—	23	22–24	—	45–7
T. truncatus	—	—	23	4	28+[5]	55+
D. delphis	—	—	—	28	—	28
C. hectori	—	—	—	4	—	4
P. gangetica	7[21]	—	—	—	—	7
P. minor	—	10[22]	—	—	—	10
Total	7	10	49	58–60	33+	157–9+

Appendix 4

REPORTED CATCHES OF SMALL CETACEANS IN 1982

Species		Canada	Denmark	France	Japan	Iceland	Non-US ETP	Turkey	USA	Other	Total
Baird's beaked whale, *Berardius bairdii*	D	—	—	—	60[J]	—	—	—	—	—	60
Cuvier's beaked whale, *Ziphius cavirostris*	D	—	—	—	—	—	—	—	—	x[15]	x
Narwhal, *Monodon monoceros*	D	402[C]	342–400[G]	—	—	—	—	—	—	—	> 744
White whale, *Delphinapterus leucas*	D	475[C]	225–400[G]	—	—	—	—	—	298–354[9]	139[16]	> 1,137
False killer whale, *Pseudorca crassidens*	D	—	—	—	1[J]	—	—	—	—	—	1
Killer whale, *Orcinus orca*	D	—	—	—	4[J]	—	—	—	—	3[K]	7
	I	—	—	—	1[J + 3]	1[1]	—	—	—	—	2
	L	—	—	—	—	5[1]	—	—	—	—	5
Long-finned pilot whale, *Globicephala melaena*	D	—	2,652[F]	—	—	—	—	—	—	—	2,652
	L	—	—	> 1[2]	—	—	—	—	—	x[15]	> 1
Short-finned pilot whale, *G. macrorhynchus*	D	—	—	—	395[J]	—	—	—	—	—	395
	I	—	—	—	3[J]	—	—	—	x[10]		> 3
	L	—	—	—	6[3]	—	—	—	2[11]		8
Pacific white-sided dolphin, *Lagenorhyncus obliquidens*	D	—	—	—	171[J + 4]	—	—	—	—	—	171
	I	—	—	—	4[J]	—	—	—	—	—	4
	L	—	—	—	13[3]	—	—	—	2[11]		15
Fraser's dolphin, *Lagenodelphis hosei*	D	—	—	—	—	—	—	—	—	x[3]	x
Bottlenose dolphin, *Tursiops truncatus*	D	—	—	> 1[2]	831[J]	—	—	x[8]	—	73 + x[15]	> 839
	I	—	—	—	3[J]	—	—	—	—	x[17]	> 3
	L	—	—	—	61[3]	—	4[6]	—	23[11]	—	88
Risso's dolphin, *Grampus griseus*	D	—	—	—	4[J]	—	—	—	—	x[15]	> 4
	I	—	—	—	2[J]	—	—	—	—	x[15]	> 2
Spotted dolphin, *Stenella attenuata*	D	—	—	—	3,799[J]	—	—	—	—	—	> 3,799
	I	—	—	—	—	—	3,189–3,847[7]	—	15,590–19,058	—	> 18,779
Spinner dolphin, *S. longirostris*	I	—	—	—	—	—	705–850[7]	—	5,972–7,301[7]	—	> 6,677
Striped dolphin, *S. coeruleoalba*	D	—	—	> 2[2]	2,016[J + 4]	—	—	—	—	x[15]	> 2,018
	I	—	—	> 1[2]	25[J]	—	97–117[7]	—	471–575[7]	x[17]	> 594
Common dolphin, *Delphinus delphis*	D	—	—	> 3[2]	99[J + 4]	—	—	x[8]	—	x[15]	> 102
	I	—	—	> 5[2]	102[J]	—	88–106[7]	—	414–506[7]	x[17]	> 609
Northern right whale dolphin, *Lissodelphis borealis*	D	—	—	—	3[4]	—	—	—	—	—	3

[*continued*]

Species		Canada	Denmark	France	Japan	Iceland	Non-US ETP	Turkey	USA	Other	Total
Commerson's dolphin,											
Cephalorhyncus commersonii	D	—	—	11[2]	—	—	—	—	—	—	11
Harbour porpoise, *Phocoena*	D	—	554–700[G]	—	57[J]	—	—	x[8]	—	—	> 611
phocoena	I	> 317[I]	—	·10[I]	66[J]	63[I]	—	—	55–> 200 {US + 1 + 13 + 12}	x[1]	> 511
	L	—	—	—	—	—	—	—		1[6]	1
Dall's porpoise, *Phocoenoides*	D	—	—	—	12,833[J]	—	—	—	—	—	12,833
dalli	I	—	—	—	4,916–12,132[5]	—		—	x[14]	—	> 4,961
Finless porpoise, *Neophocaena*	I	—	—	—	5[3]	—	—	—	—	x[18]	> 5
phocaenoides	L	—	—	—	10[3]	—	—	—	—	—	10
Unidentified or mixed		—	—	> 1[2]	30[J]	—	—	—		{1,473–3,237[19] 15,100[20]}	> 31
		—	—	—	91[J]	—	132–159[7]	—	617–754[7]		> 17,183
Total		> 1,194	> 3,773	> 35	> 25,656	69	> 4,215	x	> 23,444	> 16,493	> 74,879

Key, sources and notes: D = direct take; I = incidental capture; L = live capture; x = known to have occurred but no data available; C = Progress Report Canada; G = Greenland; F = Faroe Islands; J = Japan; I = Iceland; US = USA; K = Republic of Korea; 1 = SC/35/SM24, estimated catch; 2 = Collet; other catches are known to occur but there is no new information. 11 Commerson's dolphins were taken for scientific studies.; 3 = SC/35/SM26, with comments by Leatherwood on occasional takes of Fraser's dolphin in Taiwan; 4 = SC/35/SM10; 5 = The first number is the take reported in SC/35/SM28 and ProgRep Japan. The second number is a US estimate for take in the salmon gillnet fishery (SC/35/SM8); 6 = SC/35/SM29; 7 = SC/35/SM16, estimated catch; 8 = E. Akyuz, FAO Rome, *in litt.* to S. J. Holt; 9 = White whales captured by Alaskan Eskimos, data provided by Alaska Department of Fish and Game (for known catches), and estimated takes by Braham.; 10 = Perrin; 11 = SC/35/SM4, incomplete data for bottlenose dolphin; 12 = SC/35/SM5; 13 = D. G. Ainley and S. Allen; 14 = Balcomb; 15 = Duguy *et al.*, 1982. Known to occur off Spain, France and Italy; 16 = Catch outside the Antarctic in 1982, white whales taken by USSR; 17 = A. Aguilar; 18 = SC/35/SM2, occasional takes known in Java; 19 = SC/35/SM21, estimated incidental catches by Taiwanese vessels in Australian waters, including *T. truncatus* + *S. longirostris* + *S. attenuata* + *P. crassidens*, incomplete data as there is no information on catches in shark nets and live-capture fisheries for 1982; 20 = Estimate of catches in 1982 for Sri Lanka, including *S. longirostris* + *S. bredanensis* + *T. truncatus* + *Z. cavirostris* + *Mesoplodon sp.*—Alling, 1983 in SC/35/SM6.

Appendix 5

ERRORS IN SPECIES LISTINGS IN INTERNATIONAL WHALING STATISTICS LXXXIX AND XC

(1) In Tables Z^2 (p. 28–32) and Z^{10} (p. 42), the data for harbour porpoise, *Phocoena phocoena*, and common dolphin, *Delphinus delphis*, have been confounded. The catches by Denmark listed under 'common porpoise' were of *P. phocoena*. The catches by the US also listed under 'common porpoise' were actually of *D. delphis*.

(2) The USSR catches of southern bottlenosed whales (data from Table Z^4, p. 36) are incorrectly called *Hyperoodon ampullatus*. If all these whales were in fact all *Hyperoodon*, they would be *H. planifrons*.

(3) It was also noted that Table Z^5 (p. 37) referred to catches of pilot whales around Japan and British West Indies as *Globicephala melaena*. All of these pilot whales were *G. macrorhynchus*.